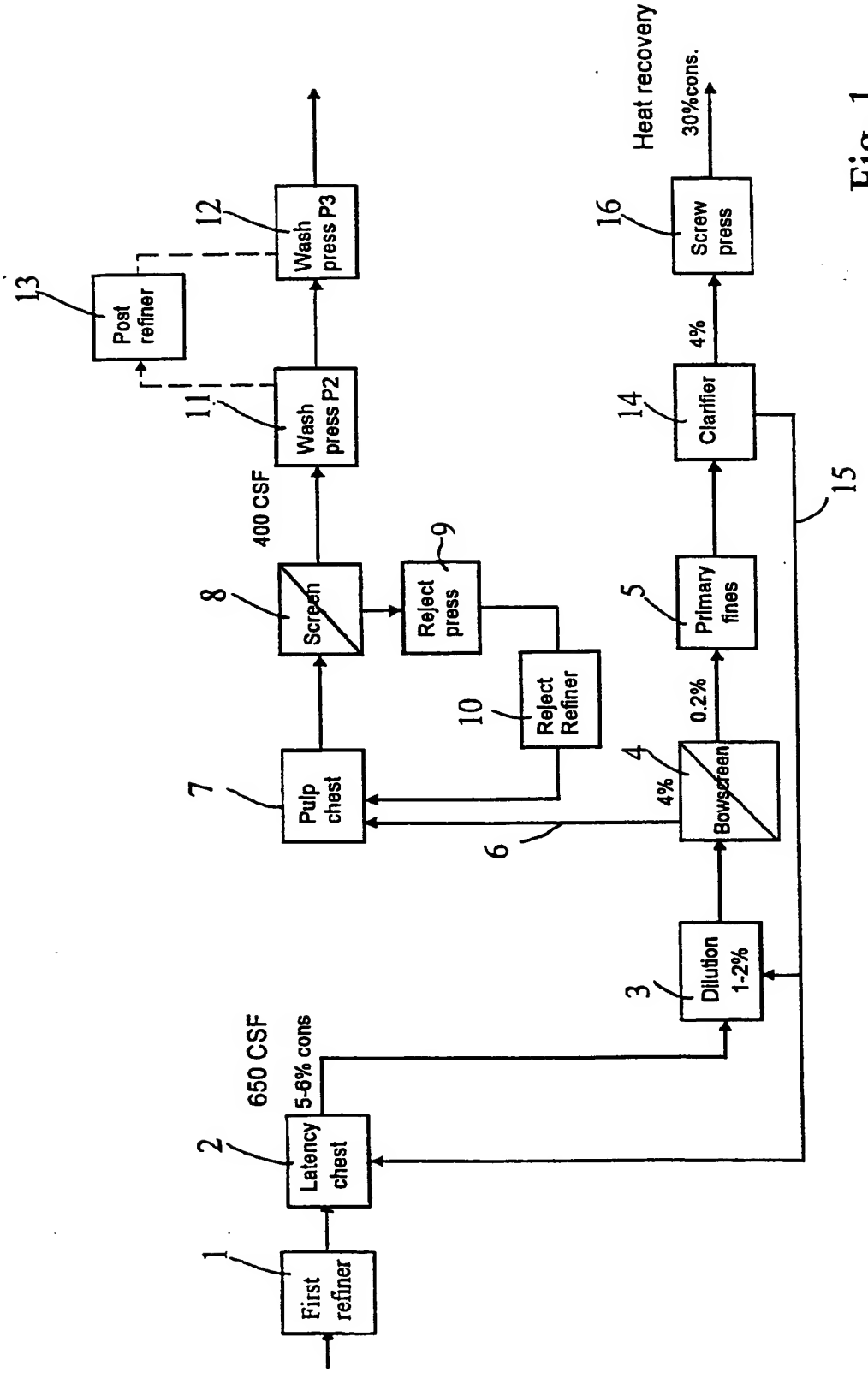
First refiner
1
650 CSF
5-6% cons
Latency chest
2
Dilution 1-2%
3
4%
Bowscreen
4
0.2%
Primary fines
5
6
Pulp chest
7
Screen
8
Reject press
9
Reject Refiner
10
400 CSF
Wash press P2
11
Post refiner
13
Wash press P3
12
Clarifier
14
4%
15
Screw press
16
30%cons.
Heat recovery

Fig. 1

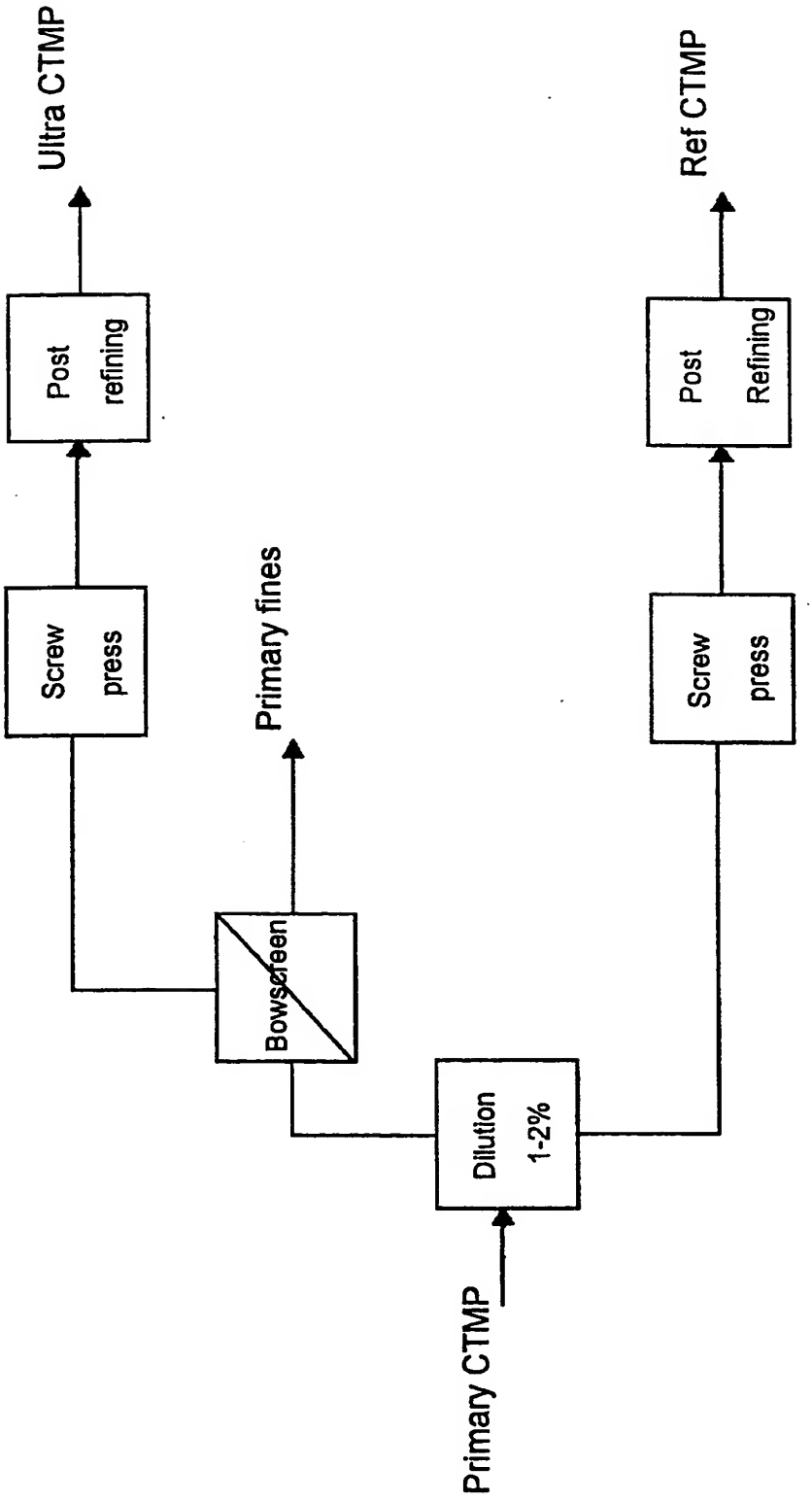
Ultra CTMP
Post refining
Screw press
Primary fines
Bowscreen
Ref CTMP
Post Refining
Screw press
Dilution 1-2%
Primary CTMP

Fig. 2

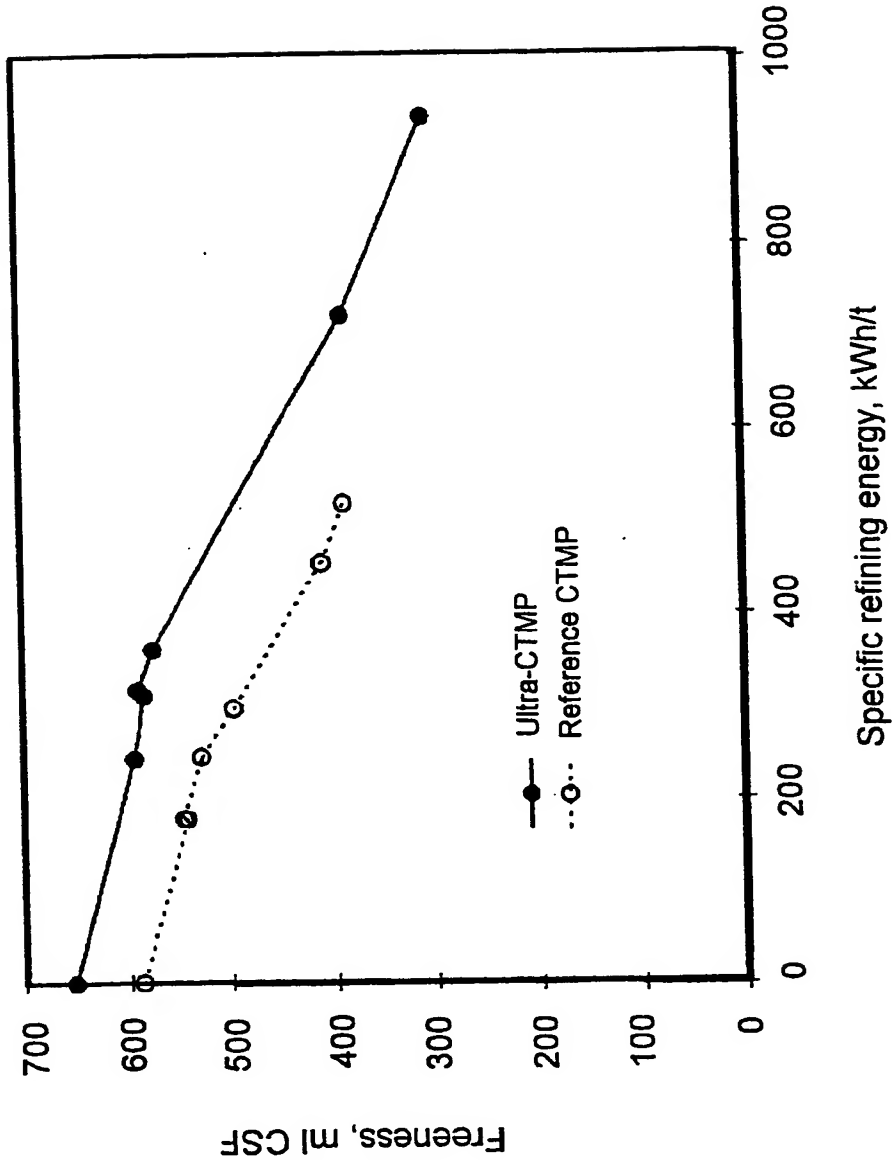
Freeness, ml CSF
700
600
500
400
300
200
100
0
Specific refining energy, kWh/t
0
200
400
600
800
1000
Ultra-CTMP
Reference CTMP

Fig. 3

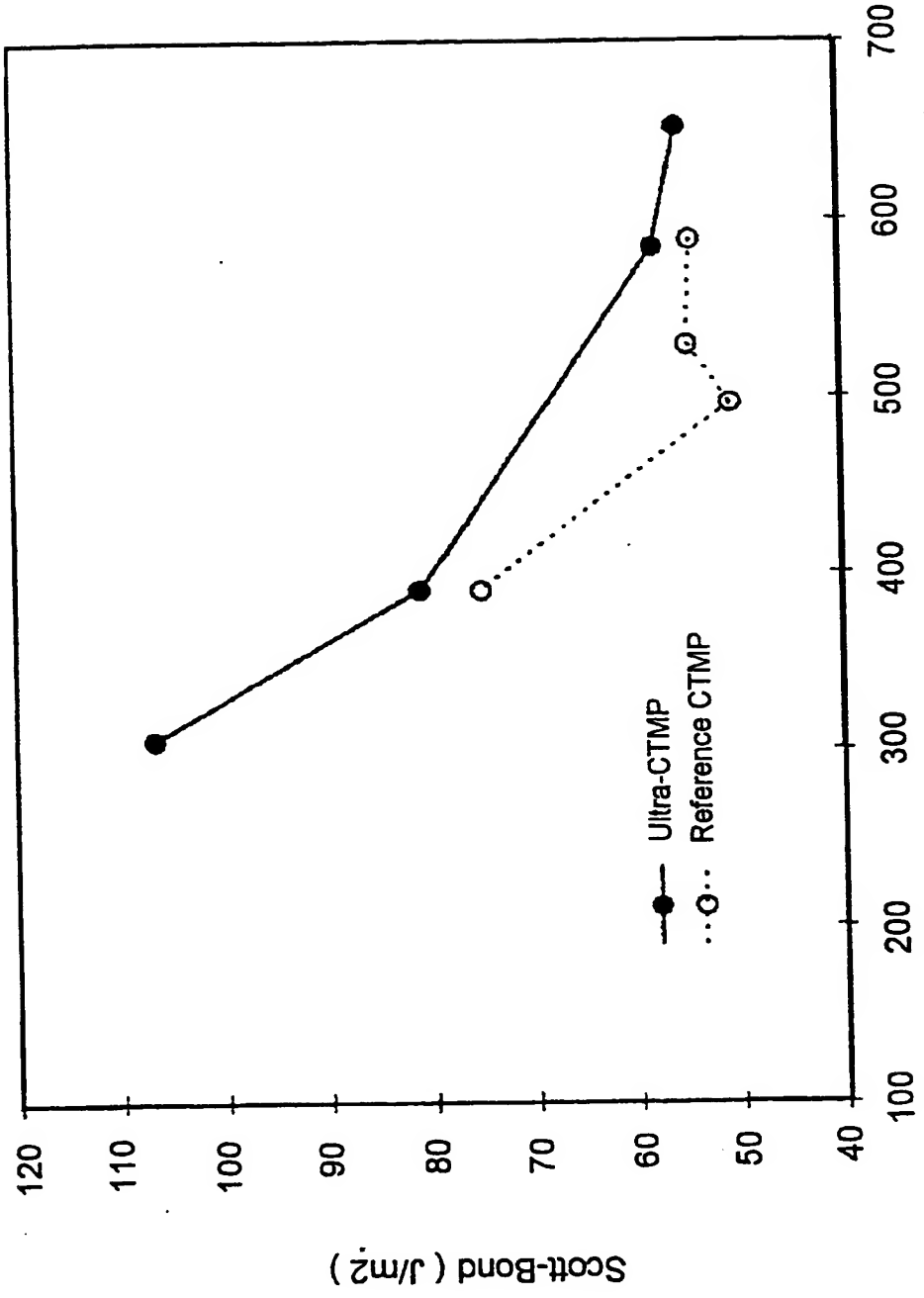
Scott-Bond (J/m2)
120
110
100
90
80
70
60
50
40
Freeness, ml CSF
100
200
300
400
500
600
700
Ultra-CTMP
Reference CTMP

Fig. 4

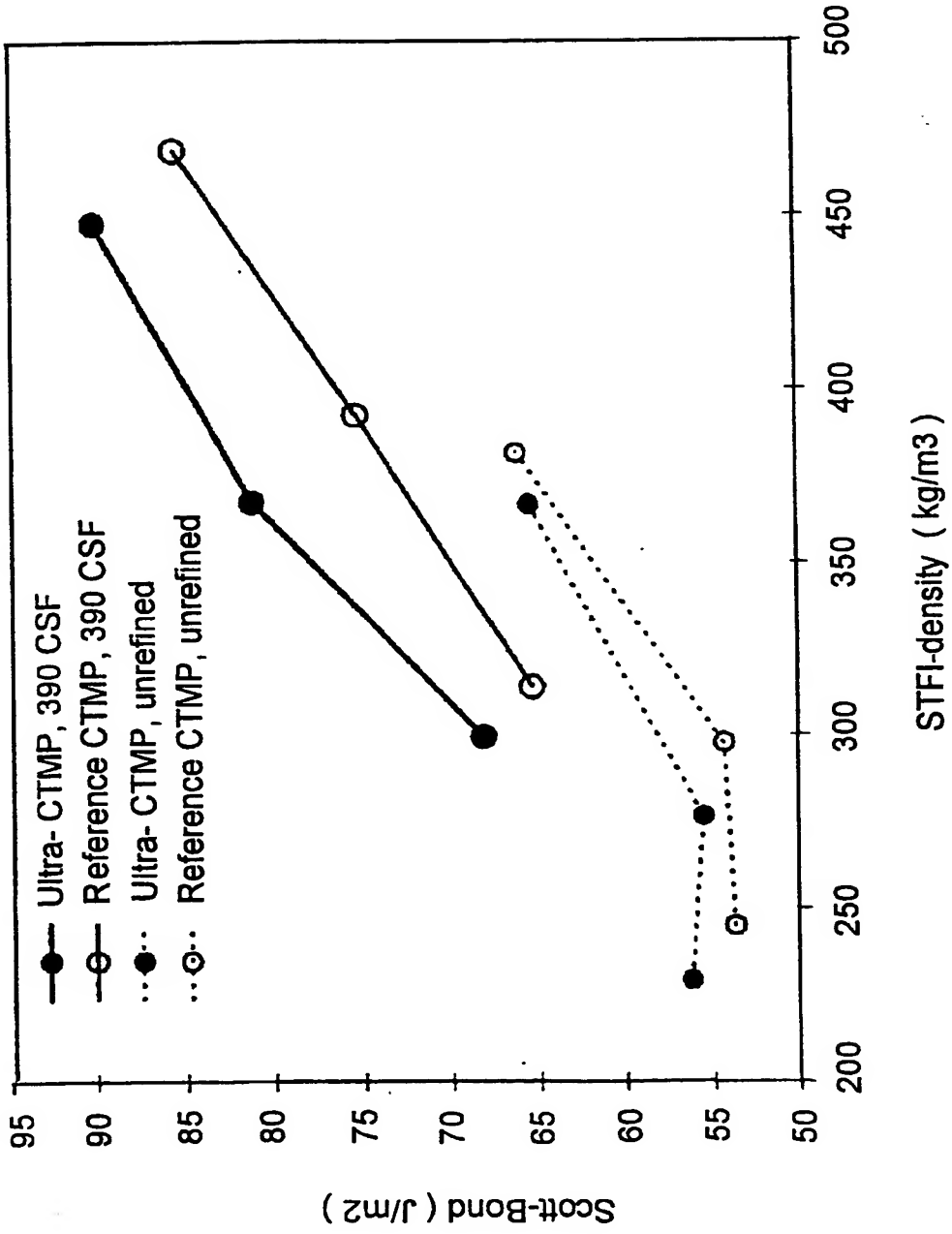
Ultra- CTMP, 390 CSF
Reference CTMP, 390 CSF
Ultra- CTMP, unrefined
Reference CTMP, unrefined
Scott-Bond (J/m2)
95
90
85
80
75
70
65
60
55
50
STFI-density (kg/m3)
200
250
300
350
400
450
500

Fig. 5

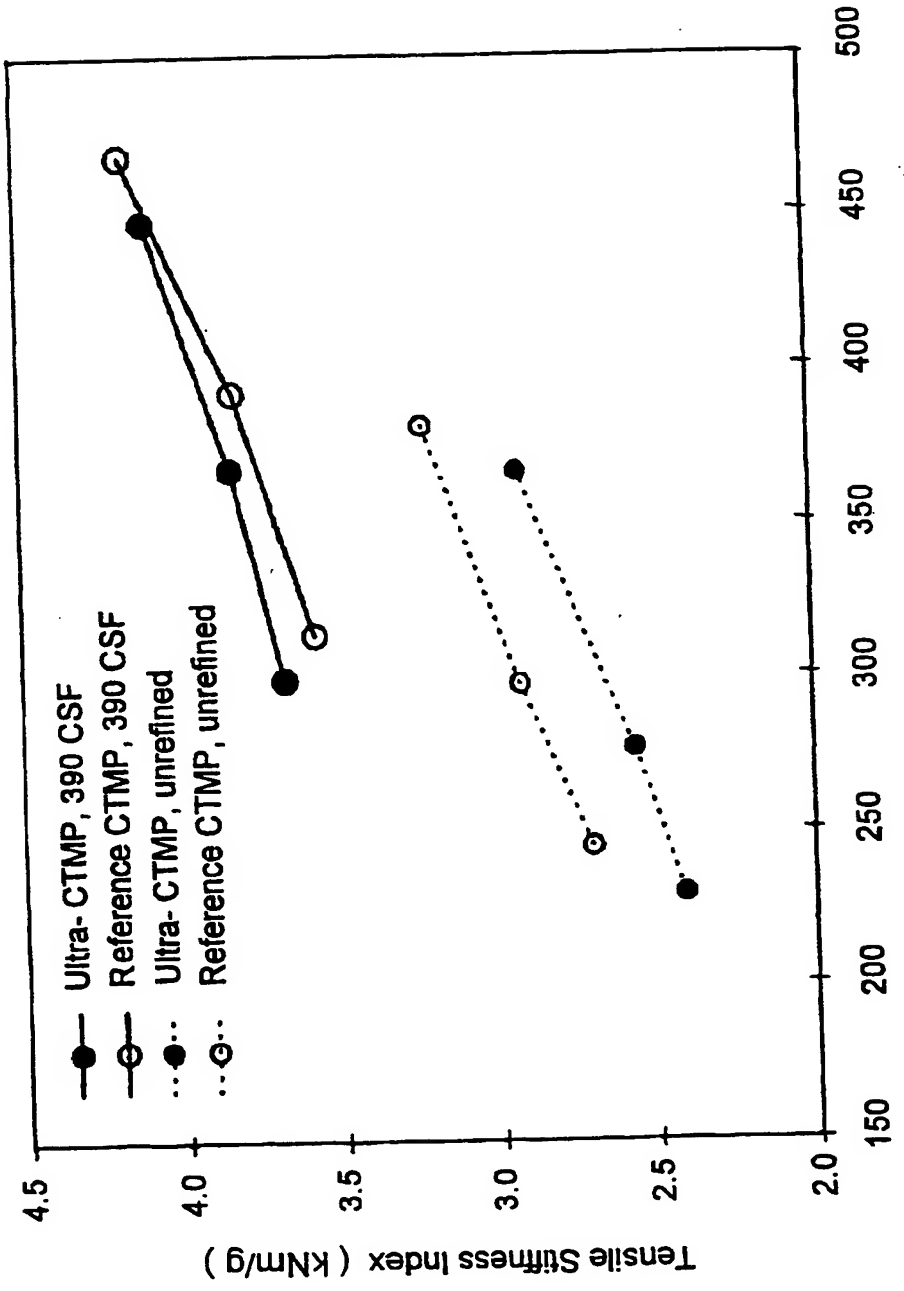
Tensile Stiffness Index (kNm/g)
4.5
4.0
3.5
3.0
2.5
2.0
STFI-density (kg/m3)
150
200
250
300
350
400
450
500
Ultra- CTMP, 390 CSF
Reference CTMP, 390 CSF
Ultra- CTMP, unrefined
Reference CTMP, unrefined

Fig. 6

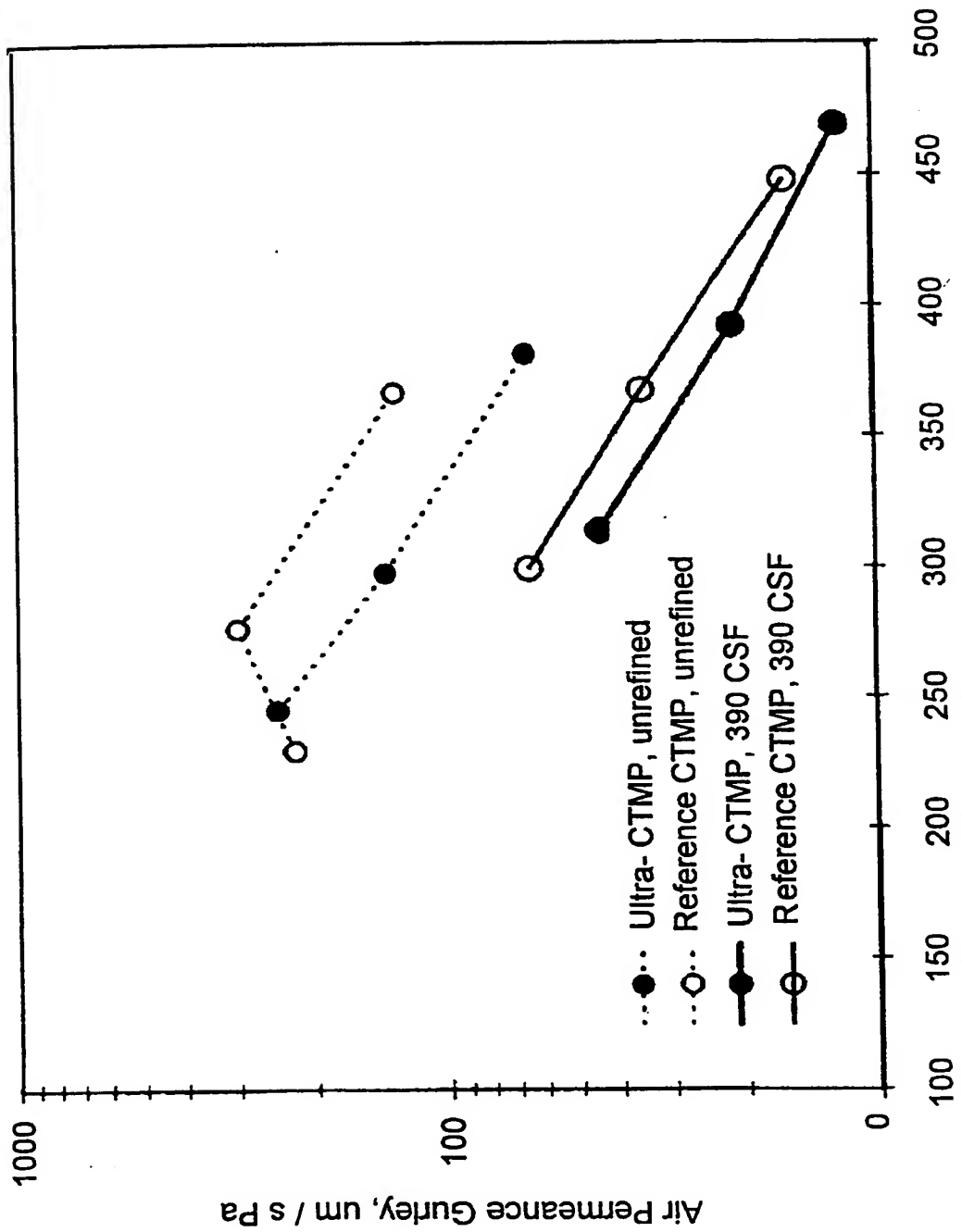
Air Permeance Gurley, um / s Pa
1000
100
0
100
150
200
250
300
350
400
450
500
STFI-density (kg/m3)
Ultra- CTMP, unrefined
Reference CTMP, unrefined
Ultra- CTMP, 390 CSF
Reference CTMP, 390 CSF

Fig. 7

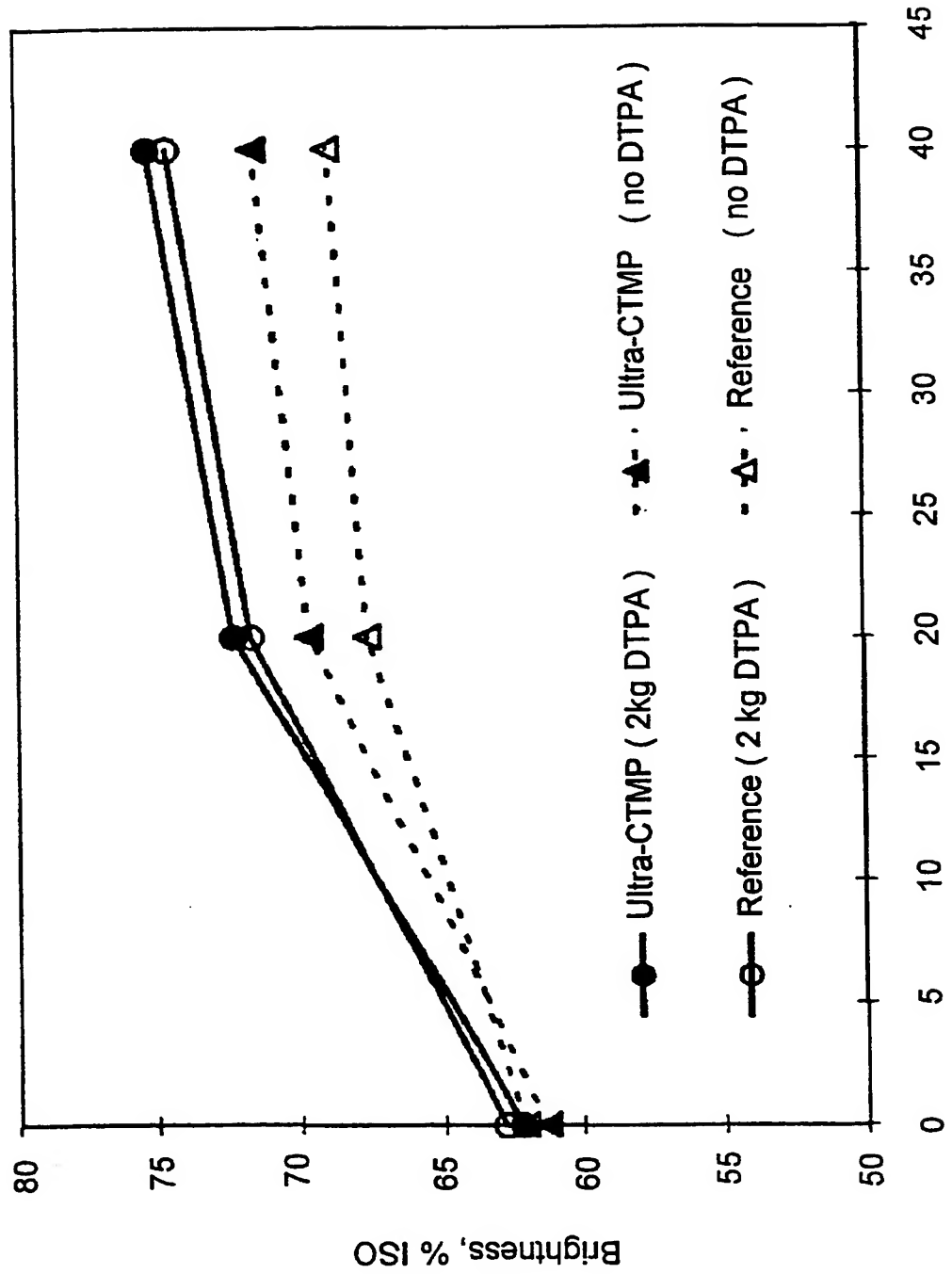
Brightness, % ISO
80
75
70
65
60
55
50
0
5
10
15
20
25
30
35
40
45
Hydrogen peroxide, kg/t
Ultra-CTMP (2kg DTPA)
Reference (2 kg DTPA)
Ultra-CTMP (no DTPA)
Reference (no DTPA)

Fig. 8